

PRELIMINARY AMENDMENT
U.S. Application No.: 09/933,832

REMARKS

Review and reconsideration on the merits are requested.

Prior art considered: U.S. Patent 2,713,379 Sisson (Sisson); U.S. Patent 2,519,107 Brown (Brown); the admitted prior art (specification, pages 1 and 2); the English abstract of JP 10-264,257 (JP '257).

The Examiner's position is set forth in detail in the Action and will not be repeated here except as necessary to an understanding of Applicants' traversal which is presented after a brief introduction.

Overview of Amendment/basis for Amendment

Claim 1 by inserting the phrase "to put the bonding surfaces into uniform contact with said adhesive sheet" at the last end of element (3) thereof;

Claim 7 by inserting the phrase "so as to reduce the weight of transport vehicles including aircraft" at the last end of element (3) thereof; and

Rewriting claim 8 in independent form with the limitation by inserting the phrase "to put the bonding surfaces into uniform contact with said adhesive sheet" at the last end of element (3) thereof.

In amended claims 1 and 8, the recitation "wherein a cushioning member is interposed between a pressing surface of said pressing magnet jig and outside surfaces of the mated portions of said non-magnetic members to put the bonding surfaces into uniform contact with said adhesive sheet." finds support at page 6, lines 22-24 of the specification.

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In amended claim 7, the recitation “so as to reduce the weight of transport vehicles including aircraft.” finds support at page 1, lines 8-25 and page 3, lines 9-11 of the specification.

Traversal

Rejection of claims 1, 2, 9, 11, 13, 15 and 17 under 35 U.S.C. § 103(a) based on Sisson in view of Brown.

As the distinguishing features of the present invention are recited in claim 1, patentability only with respect to claim 1 is discussed in the following.

Amended claim 1 of the present application calls for:

“A method for bonding a plurality of non-magnetic members comprising the steps of:

- (1) mating non-magnetic members via an uncured adhesive interposed between their surfaces to be bonded;
- (2) applying pressure to the mated portions of said non-magnetic members between a pressing magnet jig and a pressure-receiving, soft-magnetic jig; and
- (3) curing said adhesive while applying pressure,

wherein a cushioning member is interposed between a pressing surface of said pressing magnetic jig and outside surfaces of the mated portions of said non-magnetic members to put the bonding surfaces into uniform contact with said adhesive sheet.”

Thus, one major distinguishing feature of amended claim 1 lies in the fact that a cushioning member is interposed between a pressing surface of the pressing magnet jig and outside surfaces of the mated portions of the non-magnetic members to put the bonding surfaces into uniform contact with the adhesive sheet, thereby making it possible not only to appropriately select the pressure from 0.025 kgf/mm^2 to 0.8 kgf/mm^2 in the magnetic force of the magnet in bonding half-cylindrical skin members made of a fiber-reinforced composite material which constitute the fuselage of an aircraft but also to improve workability in the use of the pressing magnet jig and the pressure-receiving, soft magnetic jig (see page 3, lines 9-11, page 6, lines 6-15, page 6, line 19 to page 7, line 1 of the specification).

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In contrast to amended claim 1 of the present application, although Sisson teaches a method for bonding together overlapping portions of strips by placing the mated portion of the strips (via a bonding film) between a pressing magnet jig and a pressure-receiving soft magnetic jig by applying a clamping or squeezing pressure to the parts by applying magnetic lines of force to draw the overlapped portions of the jointed strips together, thereby fabricating cabinets, boxes, furniture, etc. (see column 1, lines 15-19, column 2, lines 21-24, lines 44-50 and Fig. 2 of Sisson), Sisson fails to teach or suggest the use of a cushioning member interposed between a pressing surface of a pressing magnet jig and outside surfaces of the mated portions of the non-magnetic members to put the bonding surfaces into uniform contact with an adhesive sheet.

Therefore, one of ordinary skill in the art, referring to Sisson, which is silent regarding the use of a cushioning member, would not be motivated to reach the invention recited in the amended claim 1, and, accordingly, amended claim 1 of the present application is not anticipated by nor obvious over Sisson.

Applicants appreciate, of course, that the rejection is a combination rejection, and now address Brown.

Brown discloses a cushioning device employed in association with clamps, clamping brackets or the like to provide a device which prevents the surface of work to which the clamps are attached from becoming scratched, deformed, or otherwise damaged. The Brown cushioning device consists of pads formed from any suitable material possessing resilient characteristics, such as synthetic rubber, Neoprene, or the like (see column 1, lines 1-11, column 2, lines 8-16 and Figs. 1 and 2).

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In contrast to Brown, the cushioning member of the present application is interposed between a pressing surface of the pressing magnet jig and the outside surfaces of the mated portions of non-magnetic members, and it functions to put the bonding surfaces from the pressing magnet jig into uniform contact with the adhesive sheet. This is done by selecting a pressure within range of from 0.025 kgf/mm² to 0.8 kgf/mm² in the magnetic force of the magnet, thereby achieving sufficient bonding strength, and also improving workability in the use of the pressing magnet jig and the pressure-receiving, soft magnetic jig (emphasis added; see page 3, lines 14-17, page 6, lines 6-15, page 6, line 19 to page 7, line 1 of the specification).

Thus, Brown fails to teach or suggest any cushioning member, which is capable of putting bonding surfaces into uniform contact with an adhesive sheet

Accordingly, Applicants respectfully submit that one of ordinary skill in the art, referring to Brown, would not reach the present invention as recited in amended claim 1 and, accordingly, amended claim 1 of the present application is unobvious over Brown alone or in combination with Sisson.

In summary, Sisson and Brown, taken alone or in combination, fail to teach or suggest a cushioning member capable of putting bonding surfaces into uniform contact with an adhesive sheet which also improves workability during use of a pressing magnetic jig and a pressure-receiving, soft magnetic jig, major features of the present invention as recited in amended claim 1.

With respect to claims 2 and 9 each dependent from the amended claim 1, their patentability is believed clear from the above discussion concerning amended claim 1.

With respect to claims 11, 13, 15 and 17, Sisson does not specifically recite the claimed bonding conditions for curing, i.e., the applied pressure, temperature, cooling rate, etc. These conditions assist the proper functioning of the cushioning member, which is interposed between a pressing surface of the pressing magnet jig and outside surfaces of the mated portions of the non-magnetic members, to put the bonding surfaces from the pressing magnet jig into uniform contact with an adhesive sheet.

Therefore, one skilled in the art, referring to Sisson, which fails to teach or suggest the use of a cushioning member, would not reach the invention recited in claims 11, 13, 15 and 17, and, accordingly, claims 11, 13, 15 and 17 of the present specification are not obvious over Sisson, even in combination of Brown, which is also silent regarding any cushioning member capable of putting bonding surfaces into uniform contact with an adhesive sheet.

Rejection of claims 7, 10, 12, 14, 16 and 18 under 35 U.S.C. § 103(a) based on Sisson in view of the admitted prior art (specifications pages 1-2 and the English abstract of JP 10-264257).

Amended claim 7 of the present application calls for:

“A method for bonding a plurality of non-magnetic members comprising the steps of:

- (1) mating non-magnetic members via an uncured adhesive interposed between their surfaces to be bonded;
- (2) applying pressure to the mated portions of said non-magnetic members between a pressing magnet jig and a pressure-receiving, soft-magnetic jig; and
- (3) curing said adhesive while applying pressure, wherein a pair of non-magnetic members are bonded together, and said non-magnetic members are half-cylindrical skin members made of a fiber-reinforced composite material for constituting a fuselage of aircraft so as to reduce the weight of transport vehicles including aircraft.”

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One major distinguishing feature of amended claim 7 lies in that a pair of non-magnetic members are bonded together, and the non-magnetic members are half-cylindrical skin members made of a fiber-reinforced composite material constituting a fuselage of an aircraft so as to reduce the weight of transport vehicles, including aircraft (see page 1, lines 8-25 and page 3, lines 14-17 of the specification).

In contrast to the invention of the amended claim 7, Sisson teaches a method for bonding overlapping portions of strips. The bonding is achieved by placing a mated portion of the strips interposed between the surfaces to be bonded. The assembly is placed between a pressing magnet jig and a pressure-receiving soft magnetic jig and clamping or squeezing pressure is applied to the joint parts by applying magnetic lines of force which draw the overlapped portions of the joint together, thereby fabricating cabinets, boxes, furniture, etc. (see column 1, lines 15-19, column 2, lines 21-24, lines 44-46 and Fig. 2 of Sisson). However, Sisson is silent regarding a pair of non-magnetic members being bonded together and the fact that the non-magnetic members are half-cylindrical skin members made of a fiber-reinforced composite material constituting a fuselage of an aircraft so as to reduce the weight of transport vehicles, including aircraft, as disclosed in the present application (see page 1, lines 8-25 and page 3, lines 14-17).

Therefore, one of ordinary skill in the art, referring to Sisson would not reach the invention recited in the amended claim 7, and, accordingly, amended claim 7 of the present application is not obvious over Sisson.

However, the rejection is a combination rejection and Applicants turn to the admitted state of the art taking JP '257 as representatives.

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JP '257 discloses a method for joining thermosetting laminated resin board comprising steps of: sandwiching at least one uncured prepreg between joint surfaces of a thermosetting laminated resin board obtained by laminate molding a prepreg; and heating at a temperature required to cause a resin in the uncured prepreg to melt and cure while applying a pressure of 2 kgf/cm² or more (see the English translation of claim 1 of JP '257 attached).

The Examiner states in Paragraph 6, in the paragraph bridging pages 4/5, of the Action that:

“The admitted prior art teaches uses the bonded fiber-reinforced composite materials to reduce the weight of transport vehicles including aircraft.”

Applicants disagree with the above for the following reasons.

JP '257 provides a method for producing a large and/or complicated shaped vessel and apparatus particularly usable in a strongly corrosive atmosphere at a temperature ranging from the boiling point of water to 300°C, such as an electrolyzer used for molten salt aluminum electroplating (see the English translation of Paragraph No. [0001], lines 5-10 of JP '257 attached). JP '257 is thus silent regarding bonded fiber-reinforced composite materials being used to reduce the weight of transport vehicles, including aircraft.

The means for applying pressure of JP '257 is not limited if it serves to generate a predetermined pressure and keep the pressure for a fixed period of time. For instance, in the case of joining in parallel as shown in Fig. 1(a), a clamp or a press is preferably used because it will not injure the joint surfaces. However, in the case of perpendicular joining, as shown in Fig. 1(b), the means as such is difficult to use, and, accordingly, small screws (or nuts and bolts) are preferably used for pressing by their clamping force due to screwing torque. In this regard, the

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screw should not bore through the joining portion over its length. The pressing force due to the small screws can be adjusted by the number (distance) of screws per the joining area and the screwing torque (see the English translation of Paragraph No. [0034], lines 5-0 of JP '257 attached).

However, even in the case of joining in parallel, as shown in Fig. 3, JP '257 teaches that when small screws are used for pressing, they might be either pulled out from the joining portion or retained in the joining portion as used. In the latter case, i.e., when small screws are retained as used, they might make it possible to improve the impact resistance of the joining portion by adding increased strength in joining due to mechanical connection by the small screws (see the English translation of Paragraph No. [0038], lines 1-6 of JP '257 attached).

Based on these features of JP '257, the specification of the present application describes important problems which arise in JP '257 (see page 1, line 28 to page 2, line 12 of the specification).

Therefore, one of ordinary skill in the art, referring to JP '257 and the admitted prior art in the specification at pages 1 and 2, all of which are silent regarding a pair of half-cylindrical skin members made of a fiber-reinforced composite material as non-magnetic members constituting the fuselage of aircraft so as to reduce the weight of transport vehicles, including aircraft as disclosed in the present application, would not reach the invention as recited in the amended claim 7, and, accordingly, amended claim 7 of the present application is not obvious over the admitted prior art, including JP '257, in view of Sisson.

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Applicants have already analyzed in detail Sisson and the admitted state of the prior art and the specification at pages 1 and 2, including JP '257.

In summary, none of Sisson or the admitted prior art, including JP '257, teaches or suggests a pair of half-cylindrical skin members made of a fiber reinforced composite material as the non-magnetic members constituting a fuselage of an aircraft so as to reduce the weight of transport vehicles, including aircraft, which are important features of the present invention as recited in amended claim 7.

Accordingly, Applicants respectfully submit that one of ordinary skill in the art, referring to Sisson, even in combination with the admitted prior art in the specification, would not be motivated to reach the invention of claims 7, 10, 12, 14, 16 and 18, even considering JP '257.

With respect to claims 10 and 12 each dependent from the amended claim 7, claim 14 dependent from claim 12, claim 16 dependent from claim 14 and claim 18 dependent from claim 16 of the present application, their patentability is believed clear from the above discussion concerning amended claim 7.

Rejection of claim 8 under 35 U.S.C. § 103(a) based on Sisson and the admitted prior art as applied above, and further in view of Brown.

Amended claim 8 of the present application calls for:

“A method for bonding a plurality of non-magnetic members comprising the steps of:

- (1) mating non-magnetic members via an uncured adhesive interposed between their surfaces to be bonded;
- (2) applying pressure to the mated portions of said non-magnetic members between a pressing magnet jig and a pressure-receiving, soft-magnetic jig; and
- (3) curing said adhesive while applying pressure, wherein a pair of non-magnetic members are bonded together, and said non-magnetic members are half-cylindrical skin

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members made of a fiber-reinforced composite material for constituting a fuselage of aircraft so as to reduce the weight of transport vehicles including aircraft, wherein a cushioning member is interposed between a pressing surface of said pressing magnet jig and outside surfaces of the mated portions of said non-magnetic members to put the bonding surfaces into uniform contact with said adhesive sheet.”

A major distinguishing feature of amended claim 8 lies in that:

(a) a pair of non-magnetic members are bonded together, where the non-magnetic members are half-cylindrical skin members made of a fiber-reinforced composite material constituting a fuselage of an aircraft so as to reduce the weight of transport vehicles, including aircraft (hereafter element (a)); and

(b) a cushioning member is interposed between a pressing surface of the pressing magnet jig and outside surfaces of the mated portions of the non-magnetic members to put the bonding surfaces into uniform contact with the adhesive sheet (emphasis added) (hereafter element (b)).

With respect to (a), which corresponds to the element (3) of amended claim 7 (now included into claim 8), earlier in this AMENDMENT it has been established that Sisson and the admitted prior art in the specification at pages 1 and 2, including JP ‘257, fail to teach or suggest a pair of half-cylindrical skin members made of a fiber-reinforced composite material as the non-magnetic members constituting a fuselage of aircraft so as to reduce the weight of transport vehicles, including aircraft.

With respect to (b), which corresponds to the element (3) of the amended claim 1, earlier in this AMENDMENT it has been established that Brown fails to teach or suggest a cushioning member capable of putting bonding surfaces into uniform contact with an adhesive sheet (emphasis added).

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As a consequence, Applicants respectfully submit that one of ordinary skill in the art, referring to Brown, would not reach the invention as recited in amended claim 8 and, accordingly, amended claim 8 of the present application is unobvious over Brown.

In short, Applicants submit that one of ordinary skill in the art, referring to Sisson, the admitted prior art and Brown, all of which are silent regarding any cushioning member which is capable of putting bonding surfaces in the uniform contact with an adhesive sheet, would not be motivated to reach the subject matter of amended claim 8 and, accordingly, Applicants respectfully submit that amended claim 8 is not obvious over Sisson and the admitted prior art even in combination with Brown.

Rejection of claims 7, 10, 12, 14 and 18 under 35 U.S.C. § 103(a) based on the admitted prior art in view of Sisson.

Earlier in this AMENDMENT, it was established that none of Sisson and the admitted prior art teaches or suggests a pair of half-cylindrical skin members made of a fiber-reinforced composite material as non-magnetic members constituting a fuselage of an aircraft so as to reduce the weight of transport vehicles, including aircraft.

Therefore, one of ordinary skill in the art, referring to the admitted prior art, even in combination with Sisson, would not reach the present invention.

With respect to claims 10 and 12 each dependent from the amended claim 7, claim 14 dependent from claim 12, claim 16 dependent from claim 14 and claim 18 dependent from claim 16 of the present application, their patentability is believed clear from the above discussion concerning amended claim 7.

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Rejection of claim 8 under 35 U.S.C. § 103(a) based on the admitted prior art and Sisson as applied above, and further in view of Brown.

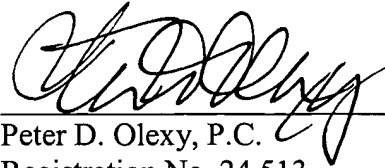
Earlier in this AMENDMENT, it was established with respect to element (a) of amended claim (8), which corresponds to element (3) of amended claim 7, that Sisson and the admitted prior art, including JP '257, fail to teach or suggest a pair of half-cylindrical skin members made of a fiber-reinforced composite material as the non-magnetic members constituting the fuselage of an aircraft so as to reduce the weight of transport vehicles, including aircraft, and with respect to element (b) of amended claim 8, which corresponds to element (3) of amended claim 1, that Brown fails to teach or suggest a cushioning member capable of putting bonding surfaces into uniform contact with an adhesive sheet, and, as a consequence, one of ordinary skill in the art, referring to Brown, would not reach the invention recited in amended claim 8, and, accordingly, amended claim 8 of the present application is unobvious over Brown.

Therefore, one of ordinary skill in the art, referring to the admitted prior art, Sisson and Brown, all of which are silent as to any cushioning member which is capable of putting bonding surfaces into uniform contact with an adhesive sheet, would not be motivated to reach amended claim 8, and, accordingly, amended claim 8 is not obvious over the admitted prior art and Sisson, even in combination with Brown.

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Withdrawal of all rejections is respectfully requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Peter D. Olexy", written over a horizontal line.

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CUSTOMER NUMBER

Date: February 24, 2004